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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,276	04/12/2006	Frank Pavatich	10191/3879	6277

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EXAMINER	
WILSON, BRIAN P	

ART UNIT	PAPER NUMBER
4163	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,276	PAVATICH ET AL.	
	Examiner	Art Unit	
	BRIAN WILSON	4163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 June 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6-30-2005, 8-28-2006*
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show first fundamental tone 60, and second fundamental tone 62 in Figure 3 as described in the specification. They also fail to show step 49 in Figure 4 as described in the specification. Figures 2-4 should also be properly labeled with words identifying corresponding parts of the diagrams, and steps of the process. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 10, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowhurst (AU Patent No. 743933) in view of Kawai (U.S. Patent 4,761,644).

Regarding claim 10, Crowhurst teaches a safety system, comprising: an electronic key having a transmitter; and a secured object having a radio base station that includes a receiver, wherein the receiver communicates with the transmitter of the electronic key in order to exchange authentication data (pg. 3, lines 14-25). Crowhurst's security system can identify an intercepting repeater by measuring the third order tones received by the receiver (pg. 5, lines 1-10). The base station then determines if access to the vehicle is to be granted (pgs. 4-5).

However, Crowhurst does not teach wherein the radio base station monitors a natural high frequency signal level received by the receiver, and wherein the radio base station detects interference in the natural high frequency signal level in order to detect a relay station.

Kawai teaches a remotely controlled electronic vehicle lock system with a receiving unit that monitors noise levels of signal transmissions (Col. 3, lines 18-26). Kawai's receiving unit comprises of a noise detector, and a high frequency interface (Col. 5, lines 55-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Crowhurst's security system that can identify interference with Kawai's system because this type of interface detects noise in a high frequency signal to increase data transmission security.

Regarding claim 18, Crowhurst teaches a method (pg. 2, lines 33-34 & pg. 3, lines 1-5) for performing a security monitoring by a safety system including an electronic key that has a transmitter and a radio base station that includes a receiver, the radio base station being associated with a protected object (pg. 3, lines 14-25), the method comprising: transmitting authentication data from the transmitter to the receiver (pg. 3, lines 14-25); monitoring by the radio base station a natural high frequency signal level received by the receiver; and detecting an interference in the natural high frequency signal level, whereby the interference is used to determine an existence of a relay station (pg. 5, lines 1-10). Crowhurst's security system can identify an intercepting repeater by measuring the third order tones received by the receiver (pg. 5, lines 1-10). The base station then determines if access to the vehicle is to be granted (pgs. 4-5).

However, Crowhurst does not specifically teach monitoring by the radio base station a natural high frequency signal level received by the receiver; and detecting an interference in the natural high frequency signal level.

Kawai teaches a remotely controlled electronic vehicle lock system with a receiving unit that monitors noise levels of signal transmissions (Col. 3, lines 18-26). Kawai's receiving unit comprises of a noise detector and a high frequency interface (Col. 5, lines 55-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Crowhurst's security system that can identify interference with Kawai's system because this type of interface detects noise in a high frequency signal to increase data transmission security.

5. Claims 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crowhurst (AU Patent No. 743933) in view of Kawai (U.S. Patent 4,761,644) as applied to claim 10 above, and further in view of Ficarra (U.S. Patent 6,775,978) and Wojtiuk (IEEE Transactions on Signal Processing Vol. 49, NO.10).

Regarding claim 11, Crowhurst in view of Kawai teach the security system as discussed above in the rejection of claim 10.

However, Crowhurst in view of Kawai do not teach that the radio base station generates random samples of a plurality of high frequency signal levels received via a plurality of frequency channels of the receiver.

Ficarra teaches a method for identifying interference events at the receiver of a wireless communication system. The base station possess the ability to measure the noise floor. The base stations can measure the noise floor by sampling idle channels for interference energy on a periodic basis (Col. 3, lines 13-17). Wojtiuk further teaches random sampling of a groupband of frequencies (Conclusion).

It would have been obvious to one of ordinary skill in the art at the time of the invention to integrate Crowhurst in view of Kawai's keyless entry system with Ficarra's periodic sampling and Wojtuik's random sampling techniques because in a random sample, all such subsets of the sampled frame are given an equal probability of occurring. This allows noise or the authentic access signal an equal probability of selection. This would increase a base stations efficiency that monitors a truly random event such as noise, to be able to properly distinguish between interference or noise. If the random samples that the base station collects correlate to an increase in interference, then unwanted disturbances are present such as a relay station. It would remain constant if the noise is white.

Regarding claim 12, Crowhurst in view of Kawai, in further view of Ficarra and Wojtiuk teach the safety system as applied to claim 11 above.

However, Crowhurst in view of Kawai do not teach wherein the radio base station performs a noise test based on the random samples in order to detect the interference.

Ficarra teaches that from energy measurement data (samples), a probability distribution of the energy can be calculated. An interference event may be identified at the receiver if the calculated probability distribution for the receiver exceeds an average probability distribution for a larger set of receivers in the system (Summary). Wojtiuk further teaches random sampling of a groupband of frequencies (Conclusion).

It would have been obvious to one of ordinary skill in the art at the time of the invention to integrate Crowhurst in view of Kawai's keyless entry system with Ficarra's method of identifying interference and Wojtuik's random samples for performing the noise test based on

random samples because noise is a random event. The random samples that the base station collects will describe the surrounding environment, and will correlate to an increase in interference if unwanted disturbances are present, or will remain constant if the noise is white.

Regarding claim 13, Crowhurst in view of Kawai, in further view of Ficarra and Wojtiuk teach the safety system as applied to claim 12 above.

However, Crowhurst in view of Kawai do not teach wherein the noise test includes a condition that is considered to be satisfied if a selected number of the random samples exceed a predetermined threshold value.

Ficarra teaches that method 1000 may mark a base station as suffering interference in its σ_j is greater than some predetermined threshold (Col. 4, lines 8-10). This is a condition that shows when the sampled data correlates with an increase in the noise floor level of the base station. Wojtiuk further teaches random sampling of a groupband of frequencies (Conclusion).

It would have been obvious to one of ordinary skill in the art at the time of the invention to integrate Crowhurst in view of Kawai's keyless entry system with Ficarra's method of using predetermined thresholds to identify increased noise with Wojtuik's random samples because if the noise isn't a relay station, the noise of the environment will not increase, and would be considered white. An increase in the noise threshold would correspond to continued disturbances such as a relay station, while white noise would remain constant and signal to the base station that there is not a problem.

Regarding claim 14, Crowhurst in view of Kawai, in further view of Ficarra and Wojtiuk teach the safety system as applied to claim 13 above.

However, Crowhurst in view of Kawai do not teach wherein the noise test is determined based on a Gaussian probability density function derived from the random samples.

Ficarra teaches that an interference event may be identified if the calculated probability distribution exceeds a predetermined threshold (Abstract). Wojtiuk further teaches normal distribution to ensure large intersample spacings are statistically unlikely (pg. 2440).

It would have been obvious to one of ordinary skill in the art at the time of the invention to integrate Crowhurst in view of Kawai's keyless entry system with Ficarra's method of using a probability distribution to model the noise floor with Wojtuik's normal distribution reconstruction, because normal distribution is commonly used to model noise in communication systems. Independent random samples of continuous random events have an equal chance of occurring (white noise), and are normally modeled using Gaussian distribution. Any interference surrounding the base station will be identified by comparing the Gaussian probability density function's deviation.

Regarding claim 15, Crowhurst in view of Kawai teach the safety system as applied to claim 10 above.

However, Crowhurst in view of Kawai do not teach wherein the radio base station records over a selected time period a plurality of random samples for each of a plurality of frequency channels, in order to represent the natural high frequency signal level.

Ficarra teaches a base station that measures the noise floor by sampling idle channels for interference energy on a periodic basis (Col. 3, lines 13-17). Ficarra also teaches that method 1000 may mark a base station as suffering interference in its σ_j is greater than some predetermined threshold (Col. 4, lines 8-10). This is a condition that shows when the sampled data correlates with an increase in the noise floor level of the base station. Wojtiuk further teaches random sampling over a groupband of frequencies (Conclusion). Also note that sampling must be done over a selected period of time, and that the samples are useless if they are not used.

It would have been obvious to one of ordinary skill in the art at the time of the invention to integrate Crowhurst in view of Kawai's keyless entry system with Ficarra's periodic sampling and noise floor identification with Wojtuik's random samples because samples that are collected randomly have an equal chance of being selected from a population of random events such as noise. This combination will enhance the performance of the base station because naturally occurring events such as noise are continuous and need to have large independent sample sizes to be correctly modeled with Gaussian distribution. An increase in the noise threshold would correspond to continued disturbances/interference while white noise would remain constant and signal to the base station that there is not a problem.

Regarding claim 16, Crowhurst in view of Kawai, in further view of Ficarra and Wojtiuk teach the safety system as applied to claim 12 above. Crowhurst further teaches wherein the radio base station and the key execute an access protocol for transmitting the authentication data (pg. 3, lines 20-23), and wherein the access protocol includes a determination as to whether at

least one of an access to the protected object and use of the protected object should be granted (pg. 3, lines 23-25), based on the noise test (pg. 5, lines 1-10).

Regarding claim 17, Crowhurst in view of Kawai, in further view of Ficarra and Wojtiuk teach the safety system as applied to claim 16 above. Crowhurst further teaches wherein the protected object is a vehicle (pg. 2, lines 4-5).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chien (6,807,227) teaches dynamic estimation of channel characteristics. Nowottnick (6,747,545) teaches passive keyless entry systems having greatly improved resistance against external attacks. Sakazume (6,538,558) teaches a communication system for a vehicle. Wood (6,265,963) teaches methods of processing wireless communications. Vu (6,002,925) teaches radio frequency transceivers and subassemblies. Cecic (5,504,473) teaches methods of analyzing signal quality of sensor systems. Ghosh (6,774,764) teaches a securing system for a motor vehicle that detects relay attacks comprising a HF interface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Wilson whose telephone number is (571)270-5884. The examiner can normally be reached Monday-Thursday from 8-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Robinson can be reached on (571)272-2319. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. W./

/Mark A. Robinson/
Supervisory Patent Examiner, Art Unit 4163